CLAIMS

1. A coolant conditioning system for supplying a coolant to at least one fuel processing subsystem, the coolant conditioning system comprising:

a coolant storage tank;

a pump to supply a coolant flow, the pump including a pump inlet and a pump outlet;

at least one coolant preheater connected to a reformate flow to transfer heat from the reformate flow to the coolant flow, the at least one coolant preheater including a coolant inlet connected to the pump outlet and a coolant outlet;

a heater connected to the coolant outlet to selectively add heat to the coolant flow when the temperature of the coolant flow at the coolant outlet falls below a minimum temperature, the heater including a heater inlet for the coolant and a heater outlet for the coolant;

at least one outlet flow path to direct a portion of the coolant flow from the heater outlet to the at least one fuel processing subsystem; and

a return flow path to return a remainder of the coolant flow from the heater outlet to the storage tank.

2. The coolant conditioning system of claim 1 wherein the pump supplies the coolant flow at a desired flow rate.

3. The coolant conditioning system of claim 1 wherein the pump supplies the coolant flow at a constant flow rate.

4. The coolant conditioning system of claim 2 wherein a flow rate of the portion of the coolant flow under normal operating conditions is less than the desired flow rate.

5. The coolant conditioning system of claim 1 further comprising at least one pressure regulator downstream from the heater to maintain the portion of the coolant flow to the at least one fuel processing subsystem at a desired pressure.

6. The coolant conditioning system of claim 1 wherein the minimum temperature is the dewpoint temperature of the reformate flow.

7. The coolant conditioning system of claim 1 further comprising a temperature sensor to measure the temperature of the coolant flow exiting the preheater.

8. The coolant conditioning system of claim 7 wherein the heater is responsive to a signal from the temperature sensor.

9. The coolant conditioning system of claim 1 wherein the heater is an electric heater.

10. The coolant conditioning system of claim 1 further comprising a makeup flow path connected to the storage tank to provide additional coolant flow to the storage tank from a coolant source.

11. The coolant conditioning system of claim 10 wherein the coolant source is a recycle flow from a fuel cell system.

12. A water conditioning system for supplying water to at least one fuel processing subsystem, the water conditioning system comprising:

a water storage tank;

a pump to supply a water flow, the pump including a pump inlet and a pump outlet;

at least one water preheater connected to a reformate flow to transfer heat from the reformate flow to the water flow, the at least one water preheater including a water inlet connected to the pump outlet and a water outlet;

a heater connected to the water outlet to selectively add heat to the water flow when the temperature of the water flow at the water outlet falls below a minimum temperature, the heater including a heater inlet for the water and a heater outlet for the water;

at least one outlet flow path to provide a portion of the water flow from the heater outlet to the at least one fuel processing subsystem; and

a return flow path to return a remainder of the water flow from the heater outlet to the storage tank.

13. The water conditioning system of claim 12 wherein the pump supplies the water flow at a desired flow rate.

14. The water conditioning system of claim 12 wherein the pump supplies the water flow at a constant flow rate.

15. The water conditioning system of claim 13 wherein a flow rate of the portion of the water flow under normal operating conditions is less than the desired flow rate.

16. The water conditioning system of claim 12 further comprising at least one pressure regulator downstream from the heater to maintain the portion of the water flow to the at least one fuel processing subsystem at a desired pressure.

17. The water conditioning system of claim 12 wherein the minimum temperature is the dewpoint temperature of the reformate flow.

18. The water conditioning system of claim 12 further comprising a temperature sensor to measure the temperature of the water flow exiting the preheater.

19. The water conditioning system of claim 18 wherein the heater is responsive to a signal from the temperature sensor.

20. The water conditioning system of claim 12 wherein the heater is an electric heater.

21. The water conditioning system of claim 12 further comprising a makeup flow path connected to the storage tank to provide additional water flow to the storage tank from a water source.

22. The water conditioning system of claim 21 wherein the water source is a recycle flow from a fuel cell system.

23. A method of operating a pressurized liquid coolant supply for use with at least one fuel processing subsystem, the method comprising the steps of:

flowing a liquid coolant from a coolant storage source through a first flow path of a coolant preheater;

flowing a reformate through a second flow path of the coolant preheater;

transferring heat from the reformate to the liquid coolant in the coolant preheater;

flowing the liquid coolant from the coolant preheater to a heater;

selectively adding heat to the liquid coolant at the heater when the temperature of the liquid coolant drops below a minimum temperature;

flowing a portion of the liquid coolant to the at least one fuel processing subsystem; and

returning the remainder of the liquid coolant to the storage source.

24. The method of claim 23 wherein the liquid coolant is flowed at a desired flow rate through the first flow path.

25. The method of claim 24 wherein a flow rate of the portion of the liquid coolant under normal operating conditions is less than the desired flow rate.

26. The method of claim 23 wherein the liquid coolant is flowed at a constant flow rate through the first flow path.

27. The method of claim 23 further comprising the step of regulating the pressure downstream from the heater to maintain the portion of the coolant flow to the at least one fuel processing subsystem at a desired pressure.

28. The method of claim 23 wherein the minimum temperature is the dewpoint temperature of the reformate flow.

29. The method of claim 23 further comprising the step of measuring the temperature of the coolant flow exiting the preheater.

30. The method of claim 29 further comprising the step of having the heater respond to the temperature of the coolant flow exiting the preheater.

31. The method of claim 23 further comprising the step of flowing a makeup flow to the coolant storage source from a coolant source.

32. The method of claim 31 wherein the coolant source is flowed from a recycle stream of a fuel cell system.

33. A method of operating a pressurized liquid water supply for use with at least one fuel processing subsystem, the method comprising the steps of:

flowing water from a water storage source through a first flow path of a water preheater;

flowing a reformate through a second flow path of the water preheater;

transferring heat from the reformate to the water in the water preheater;

flowing the water from the water preheater to a heater;

selectively adding heat to the water at the heater when the temperature of the water drops below a minimum temperature;

flowing a portion of the water to the at least one fuel processing subsystem; and

returning the remainder of the water to the storage source.

34. The method of claim 33 wherein the water is flowed at a desired flow rate through the first flow path.

35. The method of claim 34 wherein a flow rate of the portion of the water under normal operating conditions is less than the desired flow rate.

36. The method of claim 33 wherein the water is flowed at a constant flow rate through the first flow path.

37. The method of claim 33 further comprising the step of regulating the pressure downstream from the heater to maintain the portion of the water to the at least one fuel processing subsystem at a desired pressure.

38. The method of claim 33 wherein the minimum temperature is the dewpoint temperature of the reformate.

39. The method of claim 33 further comprising the step of measuring the temperature of the water exiting the preheater.

40. The method of claim 39 further comprising the step of having the heater respond to the temperature of the water exiting the preheater.

41. The method of claim 33 further comprising the step of flowing a makeup flow to the water storage source from a water source.

42. The method of claim 41 wherein the water source is flowed from a recycle stream of a fuel cell system.